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Department of Energy

ROCKY FLATS OFFICE
P.O. BOX 928
GOLDEN, COLORADO 80402-0928



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DEC 23 1992

92-DOE-14690

Mr. Martin Hestmark
U.S. Environmental Protection Agency, Region VIII
ATTN: Rocky Flats Project Manager, 8HWM-RJ
999 18th Street, Suite 500, 8WM-C
Denver, Colorado 80202-2405


Dear Mr. Hestmark:

Please find enclosed responses to comments contained in your April 13, 1992 letter to the U.S. Department of Energy Rocky Flats Office, regarding aquatic toxicity testing in support of Environmental Evaluations at the Rocky Flats Plant. Unfortunately, ecological field activities were completed at operable units 1 and 2 prior to receipt of your letter. However, aquatic toxicity testing in support of the Environmental Evaluations at operable units 5, 6 and 7 will include simultaneous collection of water chemistry samples, flow measurements and collection of water samples for Total Organic Carbon analysis.

We apologize for the delay in responding to your comments. However, these deficiencies will be corrected prior to initiating aquatic toxicity testing at operable units 5, 6 and 7.

Questions or concerns regarding the enclosed comment responses should be directed to Bruce Thatcher of my staff at 966-3532.

Sincerely,


James K. Hartman
Assistant Manager
for Environmental Management

Enclosure

cc w/Enclosure:

J. Ciocco, EM-453
B. Thatcher, ERD, RFO
B. Birk, ERD, RFO
N. Castaneda, ERD, RFO
S. Grace, ERD, RFO
J. Pepe, ERD, RFO
C. Franklin, EMB, RFO

cc w/o Enclosure:

R. Schassburger, ERD, RFO
S. Nesta, EG&G
R. Flory, EG&G
H. Wolaver, EG&G

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November 25, 1992

1992 DEC -4 P 3: 21

92-RF-13805

James K. Hartman
Environmental Management
DOE, RFO

Attn: B. Thatcher

RESPONSE TO AQUATIC TOXICITY TESTING - RLB-0738-92

In response to your request on November 2, 1992, we are addressing issues contained in a letter (8HWM-FF) from the U. S. Environmental Protection Agency (EPA) to Frazer Lockhart of the Department of Energy (DOE), dated April 13, 1992. The letter raises four questions regarding the aquatic toxicity testing and other areas for environmental evaluations (EE) conducted at the Rocky Flats Plant. In addition, we will respond to the specific points brought forth in the November 2, 1992, letter (12472) from J. K. Hartman to R. L. Benedetti.

Although the EPA letter does not reference the specific sites where EE toxicity testing is at issue, we assume that these sites are Operable Units (OU) 1 (881 Hillside) and OU2 (903 Pad), since no other OUs were being evaluated prior to April 13, 1992. The National Pollution Discharge Elimination System (NPDES) Federal Facilities Compliance Agreement (FFCA) toxicity tests are part of a separate program.

BACKGROUND

Aquatic toxicity testing at these OUs was initially conducted as a screening process to determine overall water quality. A toxicity screen involves testing 20 organisms in a non-diluted water sample as a quick test for toxicants. This screen involves no dilution series. Toxicity screening is designed to identify sites where more intensive sampling efforts are needed (see page 66 from Draft Final, Operable Unit 1, 881 Hillside Environmental Evaluation Field Sampling Plan). The screening process was never intended to be a complete monitoring effort, but rather served as a cost-effective first step in an overall focused characterization effort. We understand that the screening process undertaken was discussed and approved by Bonnie Lavelle of the EPA.

EPA COMMENTS ADDRESSED

Our responses to the specific EPA comments for OU1 and OU2 are provided below. They are based on the intended scope of the screening effort:

Comment 1. "When samples are collected for toxicity testing, simultaneous collection of water chemistry samples is not always accomplished." We agree that water chemistry data are needed to interpret results of dilution series toxicity tests. The

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OU1 and OU2 screening results have revealed a need to sample OU5 (Woman Creek) and OU6 (Walnut Creek) and analyze for dilution series toxicity and chemical components. The water collection will be synoptic for both tests. These samples will allow us to revisit the OU1 and OU2 screening tests.

Comment 2. "Flow measurements are not taken when the samples for toxicity testing are collected." Flow data are used to calculate a contaminant load to a site, but this parameter is not called for in toxicity testing protocols. When there is flow; OU5, OU6, and OU7 will include flow measurements concurrent with chemical sampling.

Comment 3. "Lower detection limits for metal analyses of water samples may be necessary to evaluate potential toxicity indications." The detection limit range that the Rocky Flats General Radiochemistry and Routine Analytical Services Protocol (1991) (GRRASP) achieves for the metals of interest (copper, cadmium, and silver) is 5-20 µg/L. It may be that under certain conditions of hardness and pH, particular metals could cause toxicity at levels below these detection limits, but this appears unlikely based upon historic information on RFP surface water metal concentrations. The OU work plans use methods and detection limits approved by EPA and Colorado Department of Health (CDH) for all OU surface waters. These methods have been used for OU1, OU2, OU3, and OU5 metal detection. The guidelines for Data Quality Objectives (EPA/540/G-87/003) require consideration of precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters. Comparability will be enhanced if the metal detection methods remain the same.

Comment 4. "Total organic carbon (TOC) is not always included in the list of chemical analysis parameters." We agree that a known TOC can better quantify the metal availability for aquatic organisms. TOC will be analyzed in samples from the Woman Creek, Walnut Creek, and Landfill drainage during the OU characterization. The toxicity testing data for OU1 are contained in the Draft Final Phase 3 RFI/RI Report, 881 Hillside Area (OU1), Volume 13, Appendix E, Environmental Evaluation. Fathead minnow mortality was significant at only one of eleven sites. However, this location, Antelope Springs (SW104), is fed by subsurface flow not influenced by RFP. In general, the headwaters of seeps do not provide a favorable environment for aquatic life. Further details on the water chemistry of location SW104 will be forthcoming with subsequent OU5 sampling and analysis.

Furthermore, the *Ceriodaphnia* sp. data from OU1 showed 25% or greater mortality from seven out of the eleven sites sampled. The Surface Water Division (SWD) reviewed the toxicity data and surface water chemical data for OU1 and discussed potential causes of the mortality with experts. Current thinking is that the problem may be the fluctuating water balance in combination with low hardness values. Low hardness may result in increased bioavailability of metals. A complete suite of water

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quality data is planned for OU5 to elucidate relationships of (*in situ*) water quality and toxicity test results.

The OU1 EE mentions the significant toxicity encountered by *Ceriodaphnia* sp. (page E-60), but detailed explanations of the usefulness of these data, relationships to other aquatic data, and suggested actions were not adequately discussed. To allow for efficient use of funds, toxicity testing will be conducted under OU5 and OU7 investigations in accordance with the EPA concerns discussed in points 1-4 above.

Preliminary toxicity data for OU2 are available. These data show a minimum survival for *Ceriodaphnia* sp. of 13/20, occurring in Pond B-5. The fathead minnow results in Pond B-3, Pond B-4, and Pond B-5 had survival of 10/20, 6/20, and 10/20, respectively. These ponds are downstream from the Sewage Treatment Plant, and historical tests have shown that the ammonia levels are associated with high mortality in fathead minnows. The ammonia concentrations for this test ranged from 11 to 30 mg/L. Ammonia toxicity has been demonstrated in fathead minnows in concentrations as low as 7 mg/L.